## CLAIMS

We Claim:

1. A method for determining an offered load estimate for each of a plurality of bins corresponding to geographic regions of a cellular wireless territory wherein a plurality of base transceiver stations (BTS's) service the territory, said method comprising the steps of:

computing for each of the plurality of bins a probability of each BTS serving a bin, and

solving an equitable resource allocation model to determine the bin offered load estimates based on inputs comprising offered load estimates for each of the plurality of BTS's, demand targets for each of the plurality of bins, and the computed probabilities, the equitable resource allocation model comprising a plurality of resource constraints and an objective function wherein the resource constraints are expressions describing relations between the computed probabilities, the BTS offered load estimates, and the bin offered load estimates and wherein the objective function is an expression describing relations between the bin demand targets and the bin offered load estimates.

2. The method of claim 1 wherein said probability computing step computes said probabilities based on means and standard deviations of signal strengths.

3. The method of claim 2 wherein said probabilities are of the form of equation (1).

4. The method of claim 2 wherein said probabilities are of the form of equation (3).

5. The method of claim 1 wherein each BTS's offered load estimate is based on the BTS's carried load and lost calls.

6. The method of claim 1 wherein each of the plurality of resource constraints corresponds to a BTS and indicates that a computed offered load for that BTS cannot exceed that BTS's estimated offered load wherein the computed offered load is given by equation (4).

7. The method of claim 1 further comprising the steps of:

receiving as inputs relative demand approximations for cellular wireless service at each of the plurality of bins, and converting the demand approximations to the demand targets such

that the sum of the demand targets for the plurality of bins equals the sum of the BTS offered load estimates for the plurality of BTS's.

8. The method of claim 1 wherein the objective function is a vector of non-increasing performance functions wherein each performance function corresponds to a bin and is a weighted normalized deviation between the bin's demand target and the bin's offered load estimate.

9. The method of claim 8 wherein the determined bin offered load estimates result in a lexographic smallest vector of performance functions, sorted in an non-increasing order, and satisfy the plurality of resource constraints.

10. The method of claim 1 further comprising the steps of:

using the determined bin offered load estimates to identify bins with relative high offered load estimates, and

using the identified bins to improve service to these bins.

11. The method of claim 1 further comprising the step of using the determined bin offered load estimates to perform load balancing among the BTS's.

12. A method for determining weights to be used for performing frequency assignment among a plurality of base transceiver stations (BTS's) of a cellular wireless territory, each BTS having an offered load estimate, and wherein the territory is divided into a plurality of logical bins each having a demand target and the plurality of bins each further having probabilities of being served by each BTS, said method comprising the steps of:

determining an offered load estimate for each of the plurality of bins by solving an equitable resource allocation model, said equitable resource allocation model comprising a plurality of resource constraints and an objective function, the resource constraints expressing relations between the probabilities of each bin being served by each BTS, the BTS offered load estimates, and the bin offered load estimates, and the objective function expressing relations between the bin demand targets and the bin offered load estimates, and

using the determined bin offered load estimates as weights to perform frequency assignment among the BTS's.

13. The method of claim 12 further comprising the step of computing for each of the plurality of bins the probability of being served by each BTS, said computing step comprising:

determining means and standard deviations of signal strengths at each bin, and

based on the means and standard deviations determining the probabilities.

14. The method of claim 13 wherein the probabilities are based on a model that a strongest received signal in a given bin serves a mobile station in that bin.

15. The method of claim 13 wherein the probabilities are based on a model that one or more strongest received BTS signals in a given bin serve a mobile station in that bin.

16. The method of claim 12 wherein each of the plurality of resource constraints corresponds to a BTS and indicates that a computed offered load for that BTS cannot exceed the BTS's estimated offered load wherein the computed offered load is given by equation (4).

17. The method of claim 12 wherein the objective function is a lexographic minimax objective function of a vector of performance functions wherein each performance function corresponds to a bin and is a weighted normalized deviation between the bin's demand target and the bin's offered load estimate and wherein the determined bin offered load estimates simultaneously produce the lexographic smallest vector of performance functions sorted in non-increasing order and satisfy the plurality of resource constraints.

18. A method for determining an offered load estimate for each of a plurality of bins in a cellular wireless network comprising a plurality of base transceiver stations (BTS), said method comprising the steps of:

computing a plurality of probabilities that express BTS to bin service relations,

based on an offered load estimate for each of the plurality of BTS's and a cellular wireless service demand approximation at each of the plurality of bins, determining the bin offered load estimates that result in the lexographic smallest vector of non-increasing performance functions and that satisfy a set of resource constraints wherein the performance functions express relations between the bin wireless service demands and the bin offered load estimates and wherein the resource constraints express relations between the computed probabilities, the BTS offered load estimates, and the bin offered load estimates.

19. The method of claim 18 wherein the probabilities are based on a model that a strongest received signal in a given bin serves a mobile station in that bin.

20. The method of claim 18 wherein the probabilities are based on a model that one or more strongest received BTS signals in a given bin serve a mobile station in that bin.

21. The method of claim 18 further comprising the step of using the determined bin offered load estimates to perform frequency assignment among the BTS's.